FAA Aircraft Certification Service Proposed FY-05 Business Plan Objective Airborne Turbulence Detection Systems (ATDS)

NASA WxAP Review 2004

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FAA Flight Plan 2004-2008

- Goals
  - Increased Safety
  - Greater Capacity
  - International Leadership
  - Organizational Excellence

FAA Flight Plan 2004-2008

- **Objectives**
  1. Reduce the commercial airline fatal accident rate
  2. Reduce the number of fatal accidents in general aviation.
  3. Reduce accidents in Alaska.
  4. Reduce the risk of runway incursions.
  5. Reduce cabin injuries caused by turbulence.
  6. Measure the safety of the US civil aviation systems with a composite index.
  7. Ensure the safety of commercial space launches.
  8. Enhance the safety of FAA's air traffic systems.

Objective 5

- Reduce Cabin Injuries caused by turbulence
  - Two strategies have been identified to achieve this objective
    - Improvements in the operational aspects
    - Development of new flight deck technologies

Objective 5
Operational Strategy

- Encourage and expand the use of best practices to prevent turbulence injuries
- Initiatives
  - In partnership with air carriers, ensure the development of standard operating procedures (SOP's)
  - Improve training in SOP's to reduce injuries
  - Improve dissemination of pilot reports and timeliness of weather forecasts to identify air turbulence areas
- Hop Potter, AFS-210 Is the focal for activity associated with this strategy

Objective 5
Aircraft Certification Strategy

- Develop and evaluate new technologies that will lessen the impact of turbulence and other weather-related issues
- Initiative
  - Continue to evaluate new airborne weather radar and other technologies

Objective 5
FY 2008 Performance Target

- Reduce serious injuries from turbulence accidents by 33% (from the FY 1996-2000 average of 18 serious injuries per year to no more than 12)

Aircraft Certification Service FY-05 Business Plan

- BP Objective

  Form an partnership with NASA and Industry to update Technical Standard Order C-63c Weather Radar, to include additional performance standards for forward-looking windshear and turbulence detection capabilities. Develop Part 25 Advisory Circular, which provides the airworthiness requirements for the installation of weather radar's with forward looking windshear and turbulence detection.

- Multi Year proposal through 2007

Aircraft Certification Service FY-05 Business Plan

- Milestones
  - FAA ACMT concurrence on FAA participation in the ATDS working Group (1st Quarter FY-05)
  - ATDS Working Group complete proposed Minimum Performance Standard (MPS) for airborne WXR with forward looking windshear and turbulence detection (4th Quarter FY-05)
  - Update and publish version "d" of TSO-C63 to include MPS (4th Quarter FY-06)
  - Develop Part 25 Advisory Circular (AC) which provides the airworthiness requirements for installation of airborne WXR's with forward looking windshear and turbulence detection (4th Quarter FY-07)

Aircraft Certification Service FY-05 Business Plan

- **FAA Team Leader – Yours Truly**
- **FAA Team Members**
  - **Kevin Mattison, AIR-130 WDC Headquarters**
  - **Guy Thiel, ANM-160 LAACO Flight Test Pilot**
  - **John McConnell, ANM-111 TAD Human Factors**
- **# Meetings**
  - 5 in 2005
  - 5 in 2006
  - 4 in 2007
- **Other Funds Need?**
  - Asked for funding to support NASA ATDS team member(s) support 3rd and 4th FY-05 and all of 06.

Near Term Focus
MPS

- **Focus on the development of a MPS for airborne radar with:**
  - **Windshear detection and avoidance**
    - SRD 10.0 – Performance specific info
    - DO-220
  - **Turbulence detection and avoidance**
    - Established Intended Function
    - Build on NASA's cert methods and tools
    - Flight Deck Display Study
    - In service evaluation Study

Near Term Focus
Intended Function

- **Based on intended function, establish the required characteristics for the various levels of crew awareness and response**
  - Level of Awareness
    - Situation – Better Magenta
    - Alerting – Alert Message and display ICON
  - Type of Response
    - Flight crew provides specific instructions to the passenger cabin
    - Flight crew uses display to maneuver the aircraft and avoid or lessen the impact of a potential turbulence encounter

Near Term Focus

Pre MPS Certification Process

- Additional Steps during MPS development
  - Develop an generic issue paper to standardize and document first TC/ATC/STC certifications to draft MPS
    - Include operational concepts and limitations for Flight Crews - Airplane Flight and Operations Manuals
    - Include any Cabin Crew Procedural requirements
    - Include any continued airworthiness requirements, i.e. Radome Characteristics

Questions?